4.7 NOISE

4.7.1 Setting

a. Overview of Sound Measurement. Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is judged to be twice as loud; a sound 20 dBA higher four times as loud, and so forth. Everyday sounds normally range from 30 dB (very quiet) to 100 dB (very loud). In general, a 3 dB change in community noise levels is noticeable, while 1-2 dB changes are generally not perceived. Noise levels typically attenuate at a rate of 6 dBA per doubling of distance from point sources such as industrial machinery. Noise from lightly traveled roads typically attenuates at a rate of about 4.5 dBA per doubling of distance. Noise from heavily traveled roads typically attenuates at about 3 dBA per doubling of distance.

In addition to the actual instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. Several rating scales have been developed to account for the known effects of noise on people. Based on these effects, the observation has been made that the potential for noise to impact people is dependent on the total acoustical energy content of the noise. A number of noise scales have been developed to account for this factor. These scales include the Equivalent Noise Level (Leq), the Day Night Noise Level (Ldn) and the Community Noise Equivalent Level (CNEL).

Leq is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. Leq is the "energy" average noise level during the time period of the sample. Leq can be measured for any time period, but is typically measured for 15 minutes, 1 hour, or 24 hours.

Ldn is a 24-hour, time-weighted average noise level. Time-weighted refers to the fact that noise which occurs during certain sensitive time periods is penalized for occurring at these times. In the Ldn scale, those events that take place during the night (10 p.m. to 7 a.m.) are penalized by 10 dB. This penalty was selected to attempt to account for increased human sensitivity to noise during the quieter period of day, where sleep is the most probable activity.

CNEL is similar to the Ldn scale except that it includes an additional 5 dBA penalty for events that occur during the evening (7 p.m. to 10 p.m.) time period. Thus, both the Ldn and CNEL noise measurements represent a 24-hour average of A-weighted noise levels with Ldn

providing a nighttime adjustment and CNEL providing both an evening and nighttime adjustment.

Intermittent or occasional noise such as that associated with stationary noise sources is not of sufficient volume to exceed community noise standards that are based on a time averaged scale such as the Ldn scale. To account for intermittent noise, the Percent Noise Level (L%) scale is used. The Percent Noise Level is the level exceeded a percentage of the time during the measurement period. Noise Ordinances are typically specified in terms of the percent noise levels. Ordinances are designed to protect people from noise sources such as music, machinery and vehicular traffic on private property.

Noise has been defined as unwanted sound and is known to have several adverse effects on people. From these known effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. These criteria are based on such known impacts of noise on people as hearing loss, speech interference, sleep interference, physiological responses and annoyance.

b. Regulatory Policies. The County of San Luis Obispo General Plan Noise Element contains goals, policies and implementation measures for the compatibility of sensitive land uses with noise. The purpose of these goals, policies and implementation measures is to reduce the various potential effects of noise on people. The Noise Element sets maximum allowable noise exposure from both transportation and stationary sources. These maximum levels are listed in Tables 4.7-1 and 4.7-2 below.

Table 4.7-1. Maximum Allowable Noise Exposure: Transportation Noise Sources

Land Use	Outdoor Activity Areas[1]	Interior Spaces	
	CNEL, dBA	CNEL, dBA	Leq, dBA[2]
Residences, Hotels and Motels, Hospitals, and Nursing and Personal Care	60[3]	45	--
Public Assembly and Entertainment	--	--	35
Offices	60[3]	--	45
Churches, Meeting Halls, Schools, Libraries and Museums	--	--	45
Outdoor Sports and Recreation	70	--	--

[1] *Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.*

[2] *As determined for a typical worst-case hour during periods of use.*

[3] *For other than residential uses, where an outdoor activity area is not proposed, the standard shall not apply. Where it is not possible to reduce noise in outdoor activity areas to 60 dB CNEL or less using a practical application of the best available noise reduction measures, an exterior noise level of up to 65 dB CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.*

Table 4.7-2. Maximum Allowable Noise Exposure: Stationary Noise Sources[1]

	Daytime (7 a.m. to 10 p.m.)	Nighttime[2] (10 p.m. to 7 a.m.)
Hourly Leq, dBA	50	45
Maximum Level, dBA	70	65
Maximum Level, dBA – Impulsive Noise	65	60

[1] *As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers or other property line noise mitigation measures.*

[2] *Applies only where the receiving land use operates or is occupied during nighttime hours.*

In addition, the Airport Land Use Plan for the San Luis Obispo County Regional Airport (ALUP) includes standards for areas subject to airport noise. The ALUP defines residences as "extremely noise sensitive land uses" and prohibits them within the projected 55-dB CNEL contour with the exception of developments that meet criteria for mitigation or infill projects.

c. Sensitive Receptors. Some land uses are considered more sensitive to ambient noise levels than others, due to the amount of noise exposure and the types of activities involved. Noise-sensitive uses that have been identified by the County include the following:

- Residential development, except temporary dwellings;
- Schools (preschool to secondary, college and university, specialized education and training);
- Health care services (hospitals);
- Nursing and personal care;
- Churches;
- Public assembly and entertainment;
- Libraries and museums;
- Hotels and motels;
- Bed and breakfast facilities;
- Outdoor sports and recreation; and
- Offices

d. Existing Conditions. The quietest areas of the County are those that are removed from major transportation-related noise sources and local industrial or other stationary noise sources. For example, rural portions of the El Pomar-Estella, Shandon-Carrizo Plain, Adelaida, Los Padres, San Luis Obispo and South County planning areas and some of the County Urban/Village areas such as Heritage Ranch are generally quiet. The noisier locations identified in the County Noise Element are areas located near Highway 101 and major arterial roadways. However, the County Noise Element indicates that existing background noise levels in many areas of the County that contain noise-sensitive land uses are relatively quiet. To preserve quiet conditions, the County has adopted noise level standards and policies to prevent degradation of the existing noise environment as much as possible.

There are a number of potentially significant sources of community noise within the County and its incorporated cities. These sources include traffic on state highways, major county

roadways and city streets, railroad operations, airport operations, military activities and industrial facilities. Specific noise sources selected for study, including transportation and stationary sources are discussed below.

Transportation Noise Sources. Sources of transportation noise include traffic on public roadways, railroad lines, and airports. Control of these noise sources is usually preempted by existing federal or state regulations. However, the effects of noise from transportation sources may be controlled by regulating the location and design of specific land uses affected by these sources.

Noise sources from major highways and roadways can vary significantly from one area of the County to another. Variables that affect how traffic noise is perceived include vehicular volume, proximity to the noise source, time of day, speed, roadway configuration, and the acoustical and topographical characteristics of the site. For example, Highway 101 traffic noises could be quite substantial at a given location if a noise measurement is taken during peak hour traffic at a short distance from the Highway, where the same noise measured at a distance of 500 feet away would be perceived as barely noticeable.

Topography also plays a significant role in the perception of traffic related noise emissions. Road segments that are cut below or elevated above existing grade will produce a quieter noise environment. Sites that have abundant vegetation (soft sites) will absorb sound pressure waves much better than an area that is predominantly asphalt or concrete (hard site).

State Highways and Major County Roadways. Major highway transportation related noise sources within the County include State Route (SR) 1, SR 41, SR 46, SR 58, U.S. Highway 101, and SR 227. Generalized noise contours have been included in the County Noise Element, and a distance of approximately 800 to 1,200 feet generally characterizes the 60 dBA noise contour for U.S. 101, which is the main north-south artery for the County (60 dB is the County threshold for mitigation). The 60 dB contours are generally much closer to the edge of pavement on SR 1, SR 41, SR 46, SR 58, and SR 227 because of the lower traffic volumes on those road segments and the acoustical and topographical characteristics of the rural areas they traverse.

County maintained roadways that generate significant noise levels are generally within the more populated areas of a community or along major arterials that connect population centers or link to a major highway. A countywide list of 60 dB contours is located in the Policy Document of the Acoustic Design Manual. The 60 dB contours vary depending on traffic volume and have not been adjusted for topography.

Railroad Noise. The mainline of the Union Pacific Railroad (formerly the Southern Pacific Transportation Company Railroad) passes through the County in a generally north-south direction. County planning areas affected by railroad noise include South County (Inland and Coastal), San Luis Bay (Inland and Coastal), San Luis Obispo, and Salinas River. According to railroad officials, an average of four freight trains and two passenger trains pass through the county every day. One of the freight trains passes through the county at night, between the hours of 10:00 p.m. and 7:00 am.

There are a variety of railroad operating conditions in the County, including grade crossings, curves, grades and congested areas within cities or unincorporated communities. As a result, speeds and the use of the warning horn vary considerably from location to location, as does the noise environment associated with train movements in the County.

Aircraft Noise. There are three public use airports located within the County: the San Luis Obispo County Airport (SBP), the Paso Robles Municipal Airport (PRB), and the Oceano Airport. Operational scenarios of each County airport suggest that by the year 2020, as the facilities reach capacity, there will be approximately four times more air traffic than present conditions (San Luis Obispo County, 2005; City of Paso Robles, 2005). The airport capacity scenario includes a shift to larger turboprop commuter aircraft and jet aircraft capable of carrying 50 to 60 passengers. As a result, aircraft noise could be quite significant in the future.

Stationary Noise Sources. The primary sources of stationary noise within the County include industrial, commercial and agricultural operations. Federal and State employee health and safety regulations (OSHA and Cal-OSHA, respectively) control noise production within an industrial or commercial facility or in close proximity to many types of agricultural equipment. However, exterior noise from such operations has the potential to exceed locally acceptable standards at nearby noise-sensitive land uses.

Stationary noise control issues focus upon two objectives: to prevent the introduction of new noise-producing uses in a noise sensitive area, and to prevent encroachment of noise-sensitive land uses upon existing noise-generating facilities. The County attempts to achieve these objectives by applying performance standards and by requiring that new noise-sensitive uses in proximity to existing noise sources include receiver-based mitigation measures.

Examples of major stationary noise sources identified within the County include:

- Union Asphalt Batch Plant, Ramada Drive (Templeton)
- Navajo Concrete Batch Plant, Ramada Drive (Templeton)
- Dirtman Sand and Gravel Plant, Templeton Road (Templeton)
- Southern Pacific Milling Company Sand and Gravel Plant (Santa Margarita)
- Southern Pacific Milling Company Concrete Plant, Suburban Road (San Luis Obispo)
- Air-Vol Block, Suburban Road (San Luis Obispo)
- Light Industrial Uses, El Camino Real, Brisco Road, and Hillcrest Drive (Arroyo Grande)
- Commercial Use, Brisco Road and Grand Avenue (Arroyo Grande)
- The Cannery (Morro Bay)
- Commerce/Chandler Area (Paso Robles)
- North River Road Area (Paso Robles)
- San Luis Tank (Paso Robles)
- Union/Golden Hill Road Area (Paso Robles)
- Camp Roberts Military Reservation (San Miguel)
- Produce Cold Storage Facilities (Oceano)

4.7.2 Impact Analysis

a. Methodology and Significance Thresholds. For purposes of this EIR, an impact is significant if development pursuant to the proposed Grading and Stormwater Management

Ordinances would expose existing and future sensitive receptors to noise levels exceeding County standards. Pursuant to the State CEQA Guidelines, potentially significant impacts would result if the Grading and Stormwater Management Ordinances would result in:

- *Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;*
- *Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels;*
- *A substantial permanent increase in ambient noise levels above levels existing without the project;*
- *A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or*
- *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, or in the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.*

Additionally, the County of San Luis Obispo has established local thresholds pertaining to noise. Impacts would be significant if development resulting from the project would do any of the following:

- *Expose people to noise levels that exceed the County Noise Element thresholds;*
- *Generate increases in the ambient noise levels for adjoining areas;*
- *Expose people to severe noise or vibration.*

b. Project Impacts and Mitigation Measures.

Impact N-1 The proposed Grading and Stormwater Management Ordinances would modify current development standards, leading to construction and construction-related noise and vibration. This is a Class III, *less than significant* impact.

Construction noise and vibration from individual projects in accordance with the proposed Grading and Stormwater Management Ordinances could have significant noise impacts on adjacent noise-sensitive land uses. The proposed Grading and Stormwater Management Ordinances are intended to strengthen protections on illicit discharges from construction sites and post-construction discharges for specific uses. These new provisions will require additional facilities to handle and treat stormwater, for certain types of projects. Drainage facilities, such as basins and concrete drains, could be constructed in proximity to sensitive noise receptors. Additionally, accommodation of such facilities could necessitate additional alteration of terrain, which could have the potential to alter line-of-sight noise transmission.

The proposed revisions would modify the types of projects that can go through the Alternative Review Process. This process is overseen by either a federal agency (NRCS) or local agency (RCDs). Projects which are permitted through this process are also subject to an environmental determination under the same or similar parameters.

Overall, the proposed revisions will strengthen the review criteria for most development projects. However, the modification of development standards could result in more construction vehicles traveling on local roadways, and would result in more noise from building construction and cleanup. As a result, construction-related noise impacts would be potentially significant. Existing policies and requirements, however will reduce impacts to a less-than-significant level.

Construction would cause temporary, short-term noise/vibration impacts on adjacent noise-sensitive land uses. The highest noise levels would generally occur during excavation and foundation development, which involve the use of such equipment as backhoes, bulldozers, shovels, and front-end loaders. In addition, construction vehicles traveling on local roadways can generate substantial noise levels that affect adjacent receptors. As depicted in Table 4.7-3, average noise levels associated with the use of heavy equipment at construction sites can range from about 65 to 88 dBA at a distance of 50 feet from the source, depending upon the types of equipment in operation and the phase of construction.

Table 4.7-3. Typical Noise Level Ranges at Construction Sites

Construction Phase	Average Noise Level at 50 Feet	
	Minimum Required Equipment On-Site	All Pertinent Equipment On-Site
Ground Clearing	83 dBA	83 dBA
Excavation	75 dBA	88 dBA
Foundations	81 dBA	81 dBA
Erection	65 dBA	81 dBA
Finishing and Cleanup	72 dBA	88 dBA

Source: Bolt, Beranek and Newman, "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances," prepared for the U.S. Environmental Protection Agency, 1971.

Since there are no applications or established timeframes for individual development projects in accordance with the proposed Grading and Stormwater Management Ordinances, it is not possible to determine exact noise levels, locations, or time period for construction. However, construction noise and vibration would be a short-term impact for any individual project.

Existing ordinance regulations and General Plan policies exist to address noise and vibration. Short-term construction phase noise generation is regulated under Titles 22 (Land Use) and 23 (Coastal Zone Land Use) of the County Code:

- Countywide, construction noise is restricted for all projects to the hours between 7:00 am and 9:00 pm on weekdays and 8:00 am to 5:00 pm on weekends.
- Noise levels, as measured at exterior property lines, is limited to specific decibel levels. Decibel levels are set both for indoor and outdoor areas. These levels will ensure that noise effects on adjacent owners will be below established thresholds.
- Detrimental earth-borne vibrations are prohibited at or beyond the property line of the parcel containing the use.

Mitigation Measures. Existing requirements under the Land Use and Coastal Zone Land Use Ordinances and under the Noise Element will ensure that both short-term and long-term

noise impacts are fully addressed. These existing requirements ensure that any noise/vibration impacts will not be significant. No measures beyond the existing requirements are necessary.

Significance after Mitigation. Implementation of existing ordinance and General Plan requirements will ensure that noise impacts will be reduced to a less-than-significant level.

Impact N-2 The proposed Grading and Stormwater Management Ordinances would modify current development standards, leading to associated increases in traffic. Long-term traffic could increase noise levels at existing receptors throughout the County. This is a Class III, *less than significant*, impact.

The proposed Grading and Stormwater Management Ordinances are intended to strengthen protections relating to illicit discharges from construction sites and post-construction discharges for specific uses.

Regarding long-term noise impacts, it is important to note that development facilitated through the proposed Grading and Stormwater Management Ordinances would be consistent with the buildout potential anticipated under the County's General Plan. As a result, long-term noise and vibration impacts resulting from grading and excavation would not necessarily be greater than what could currently occur without the proposed project.

While the Grading and Stormwater Management Ordinances will not result in an increase in density and intensity beyond General Plan figures, buildout under the General Plan will result in additional construction. This can result in long-term noise/vibration impacts from the placement of sensitive receptors in areas with existing noise/vibration-related issues. Additionally, this can result in a cumulative increase in noise on a long-term basis due to additional vehicle trips.

These vehicle trips generated through the implementation of the proposed program would be distributed throughout the County, including major transportation corridors such as State Route (SR) 1, SR 41, SR 46, SR 58, U.S. Highway 101, and SR 227. Adding traffic to major roadways could lead to increased noise levels. Since there are no applications for individual development projects, it is not possible to determine the level of increase at this time. However, because roadway noise could exceed the County's threshold of 60 dBA CNEL at sensitive receptors, impacts are potentially significant.

Long-term impacts pertaining to placement of sensitive receptors near noise and vibration are fully addressed under the Noise Element of the General Plan. Projects will be reviewed for consistency with the Noise Element. The Noise Element prescribes specific mitigation packages based on certain circumstances. Additionally, the Noise Element identifies when an acoustical analysis must be conducted. When an acoustical analysis is prepared, projects must incorporated recommended measures to offset noise impacts. Existing requirements under the Land Use and Coastal Zone Land Use Ordinances and under the Noise Element will ensure that both short-term and long-term noise impacts are fully addressed.

The proposed revisions would also introduce agricultural exemptions and the Alternative Review Process to the Coastal Zone. Presently, most agricultural grading in the Coastal Zone

requires grading permit approval. By adding exemptions and the ability for certain projects to be reviewed by the Natural Resources Conservation Service (NRCS) or one of the County's two Resource Conservation Districts (RCDs), this could potentially facilitate grading for agricultural uses in proximity to sensitive noise receptors. The proposed addition of agricultural exemptions and the option for alternative review would not affect the implementation of established County noise policies.

Introduction of the agricultural exemption and the alternative review process to the Coastal Zone and modification of criteria and qualification for these programs countywide could result in expansion of agricultural uses and associated facilities. Agricultural use could create noise which could impact sensitive receptors. Agricultural noise sources include farming equipment, wind machines, well water pumps, and pest repelling devices. The County's Right to Farm Ordinance discloses land use conflicts associated with non-agricultural development occurring in proximity to agricultural uses. Additionally, Section 4.1 of this document, *Agricultural Resources*, includes mitigation measures to avoid land use conflicts between agricultural and non-agricultural development. Mitigation measures include the use of agricultural buffers in compliance with the County's buffer policy.

Overall, the proposed revisions will strengthen the review criteria for most development projects. Projects which are subject to the Municipal Separate Storm Sewer System (MS4) requirements will need to consider stormwater management upfront, during the initial land use permit or land division process. This will enable consideration of the effect of increased traffic levels from the construction of stormwater and drainage facilities on the existing noise environment, and will allow the review authority to consider and address any potential noise issues upfront.

Mitigation Measures. Existing requirements under the Land Use and Coastal Zone Land Use Ordinances and under the Noise Element will ensure that both short-term and long-term noise impacts are fully addressed. Additionally, mitigation measures provided in Section 4.1, *Agricultural Resources*, will ensure that any impacts caused by an increase in agricultural use are fully addressed. These existing requirements ensure that any noise/vibration impacts will not be significant. No measures beyond the existing requirements are necessary.

Significance after Mitigation. Existing requirements under the Land Use and Coastal Zone Land Use Ordinances and under the Noise Element will ensure that both short-term and long-term noise impacts are fully addressed. These existing requirements ensure that any noise/vibration impacts will not be significant. No measures beyond the existing requirements are necessary.

c. Cumulative Impacts. Cumulative traffic increases associated with future additional development from the Grading and Stormwater Management Ordinances would incrementally increase noise levels along County roadways. However, with the incorporation of mitigation measures listed above, noise related impacts from future development in the County would be reduced. Therefore, the Grading and Stormwater Management Ordinances are not expected to have any cumulative impact on noise environment.